

What is claimed is:

- 1 1. A method for optimizing a database query, the database query including criteria that  
2 references a plurality of tables in order to re-order a result set generated for the database  
3 query; the method comprising the steps of:  
4       applying transitive closure analysis to the query; and  
5       based on the transitive closure analysis, rewriting the criteria to generate modified  
6 criteria to reduce the number of tables referenced thereby.
- 1 2. The method according to claim 1, wherein the criteria is one of a GROUP BY clause  
2 and an ORDER BY clause.
- 1 3. The method according to claim 1, wherein the determining step further comprises the  
2 step of:  
3       determining if the criteria references a first field from a first table and a second  
4 field from a second table.
- 1 4. The method according to claim 3, wherein the rewriting step comprises the step of:  
2       rewriting the criteria to reference the first field and a third field from the first  
3 table.
- 1 5. The method according to claim 1, further comprising the step of:  
2       determining if the criteria references a plurality of tables.

- 1           6. The method according to claim 1, wherein the step of rewriting further includes the  
2           step of:  
3                 rewriting the criteria to generate modified criteria that references only one table,  
4           based on the transitive closure analysis.
- 1           7. The method of claim 1, further comprising the step of:  
2                 building an index over a column of the one table.
- 1           8. The method of claim 1, further comprising the step of:  
2                 building an index over more than one column of the table.
- 1           9. The method according to claim 1, wherein the database query involves a plurality of  
2           join operations and the method further comprises the step of:  
3                 running the query according to a join order that is based on the modified criteria.

1        10. A method of optimizing a database query, the database query including criteria that  
2        operates to re-order a result set of the database query and requires creating a temporary  
3        file during operation, the method comprising the steps of:

4                applying transitive closure analysis to the query; and  
5                rewriting the criteria, based on the transitive closure analysis, to generate a  
6        modified criteria; said modified criteria operating to re-order a result set of the database  
7        query and avoid creating a temporary file during operation.

1        11. The method according to claim 10, wherein the criteria is one of a GROUP BY  
2        clause and an ORDER BY clause.

1        12. The method according to claim 10, wherein the criteria references a plurality of  
2        tables and the modified criteria references a single table.

1        13. A method for optimizing a database query, the database query involving a plurality of  
2        join operations and a plurality of search conditions, the method comprising the steps of:  
3                applying transitive closure analysis to the plurality of search conditions to  
4        determine a subset of equivalent search fields; and  
5                rewriting a criteria, that operates to re-order a result set of the database query, to  
6        generate a set of respective modified criteria that each reference one or more equivalent  
7        search fields.

1        14. The method according to claim 13, wherein the modified criteria comprises one of an  
2        ORDER BY clause and a GROUP BY clause.

1        15. The method according to claim 13; further comprising the step of:  
2                running the query according to a join order, the join ordered determined by  
3        selecting one of the set of respective modified criteria.

1        16. The method according to claim 13, further comprising the step of:  
2                identifying a subset of the respective modified criteria that reference a single,  
3        respective table and for which an index to that table exists.

1 17. The method according to claim 13, further comprising the step of:

2 identifying a subset of the respective modified criteria that reference a single,  
3 respective table and for which an index is to be created.

1 18. The method according to claim 13, further comprising the step of:

2 running the query according to a join order, the join order determined by selecting  
3 one of the subset of respective modified criteria.

1 19. The method according to claim 13, further comprising the steps of:

2 performing cost analysis on each of the set of respective modified criteria; and  
3 running the query according to a join order, the join order determined based on the  
4 cost analysis.

1       20. A program product, comprising:

2               program code configured upon execution thereof to:

3                       apply transitive closure analysis to a query that includes criteria that  
4       references a plurality of tables in order to re-order a result set generated for the query, and  
5       based on the transitive closure analysis, rewrite the criteria to generate modified criteria to  
6       reduce the number of tables referenced thereby; and

7               a signal bearing medium bearing the program code.

1       21. The program product of claim 20, wherein the program code is further configured to:

2               run the query according to a join order that is based on the modified criteria.

1       22. A program product, comprising:

2               program code configured upon execution to:

3                       apply transitive closure analysis to a plurality of search conditions to  
4       determine a subset of equivalent search fields within a database query involving a  
5       plurality of join operations and the plurality of search conditions, and rewrite a criteria,  
6       that operates to re-order a result set of the database query, to generate a set of respective  
7       modified criteria that each reference one or more equivalent search fields; and  
8               a signal bearing medium bearing the program code.

1       23. The program product of claim 22 further configured to:

2               run the database query according to a join order, the join ordered determined by  
3       selecting one of the set of respective modified criteria.

1       24. An apparatus, comprising:

2             at least one processor;

3             a memory coupled with the at least one processor; and

4             a program code residing in memory and executed by the at least one processor, the  
5       program code configured to apply transitive closure analysis to a query that includes  
6       criteria that references a plurality of tables in order to re-order a result set generated for  
7       the query, and based on the transitive closure analysis, rewrite the criteria to generate  
8       modified criteria to reduce the number of tables referenced thereby.